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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,596	06/24/2003	Kaicheng Chang	CHAN3205/EM	1491

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EXAMINER	
CHIN, PAUL T	
ART UNIT	**PAPER NUMBER**
3652	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/601,596	CHANG ET AL.	
	Examiner	Art Unit	
	PAUL T. CHIN	3652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,6 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,6 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment and the arguments, filed December 8, 2006, have been fully considered but they are not persuasive. **THIS ACTION IS MADE FINAL.**

Claim Objections

2. Claim 14 is objected to because of the following informalities: it appears that the recited word "means" in line 1 should be changed to -- mechanism -- because claim 1 recites "a supporting mechanism" in line 8. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,3,5,6, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breu et al. (5,263,753) (see PTO-892) in view of Conway et al. (5,538,305) (see PTO-892) and further in view of Regan et al. (US 2004/0002121) (see PTO-892).

Breu et al. (5,263,753) discloses a clutching mechanism comprising at least one elastic layer, a flexible membrane (3) (see Figs. 1 and 2), at least two protrusions (8,8) on the lower surface, each having a tip, a supporting mechanism (2) on the upper surface, and a driving mechanism (7), a vacuum pump (lines 61-67 of Col. 1) to deform the layer. The intended use of Breu et al. gripper (5,263,753) is for use in the food industry and in the manufacturing of electronic components such as integrated circuits (Col. 1, lines 34-37). Note that the integrated circuits are very small objects, but the reference is silent about the size of the gripped object. However, Conway et al. (5,538,305) teaches a

robotic arm comprising a micro-gripper or a micromanipulator (1206,1207) capable of gripping small objects as small as a micron. Accordingly, it would have been obvious to those skilled in the art to optimize the gripper (8,8) of Breu et al.'s gripper (5,263,753) to be small as taught by Conway et al. (5,538,305) in order to grip very small objects. The modified Breu et al. gripper does not specifically show that the material selection for the membrane, or the elastic layer is silica gel. However, Regan et al. teaches that a membrane (110) (Fig. 1C) or a flexible membrane (158), or a micro-platform, having a thickness of at least 1 mm, which can be made of silica (paragraphs 46 and 84), and silica gel for air drying (paragraph 80). Accordingly, it would have been obvious to those skilled in the art to provide a material selection of silica or silica gel or Teflon on the membrane or elastic layer (3) of Breu et al to provide a thin and reliable layer.

Re claim 5, the shape of the protrusion (8) is a cylinder (Figures 1-4 of Breu's gripper).

Re claim 6, Breu et al. device (5,263,753) also teaches a vacuum pump (lines 61-67 of Col. 1).

Re claim 14, the middle portion (4) of the supporting mechanism (2) does not obstruct the deformable area even when the deformable area is sunken inwardly.

5. Claims 1,3,5,6, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breu et al. (5,263,753) (see PTO-892) in view of Miller et al. (5,163,728) and further in view of Regan et al. (US 2004/0002121) (see PTO-892).

Breu et al. (5,263,753) discloses a clutching mechanism comprising at least one elastic layer, a flexible membrane (3) (see Figs. 1 and 2), at least two protrusions (8,8) on the lower surface, each having a tip, a supporting mechanism (2) on the upper surface, and a driving mechanism (7), a vacuum pump (lines 61-67 of Col. 1) to deform the layer.

The intended use of Breu et al. gripper (5,263,753) is for use in the food industry and in the manufacturing of electronic components such as integrated circuits (Col. 1, lines 34-37). Note that the integrated circuits are very small objects, but the reference is silent about the size of the gripped object. However, Miller et al. (5,163,728) teaches small grippers (140,140) to grip a semiconductor (199) (see Fig. 14) under a microscope (49). Accordingly, it would have been obvious to those skilled in the art to optimize the gripper (8,8) of Breu et al.'s gripper (5,263,753) to be small as taught by Miller et al. (5,163,728) in order to grip very small objects. The modified does not specifically show that the material selection for the membrane, or the elastic layer is silica gel. However, Regan et al. teaches that a membrane (110) (Fig. 1C) or a flexible membrane (158), or a micro-platform, having a thickness of at least 1 mm, which can be made of silica (paragraphs 46 and 84), and silica gel for air drying (paragraph 80). Accordingly, it would have been obvious to those skilled in the art to provide a material selection of silica or silica gel or Teflon on the membrane or elastic layer (3) of Breu et al to provide a thin and reliable layer.

Re claim 5, the shape of the protrusion (8) is a cylinder (Figures 1-4 of Breu's gripper).

Re claim 6, Breu et al. device (5,263,753) also teaches a vacuum pump (lines 61-67 of Col. 1).

Re claim 14, the middle portion (4) of the supporting mechanism (2) does not obstruct the deformable area even when the deformable area is sunken inwardly.

Response to Arguments

6. Applicant's arguments filed June 20, 2006, have been fully considered but they are not persuasive.

Breu et al. (5,263,753) in view of Conway

Applicant's arguments on the "Breu et al. gripper (5,263,753) in view of Conway" have been carefully considered and they are not persuasive.

Applicant lengthily argues that "it would not be obvious to optimize the gripper disclosed in Breu to be a micro-gripper".

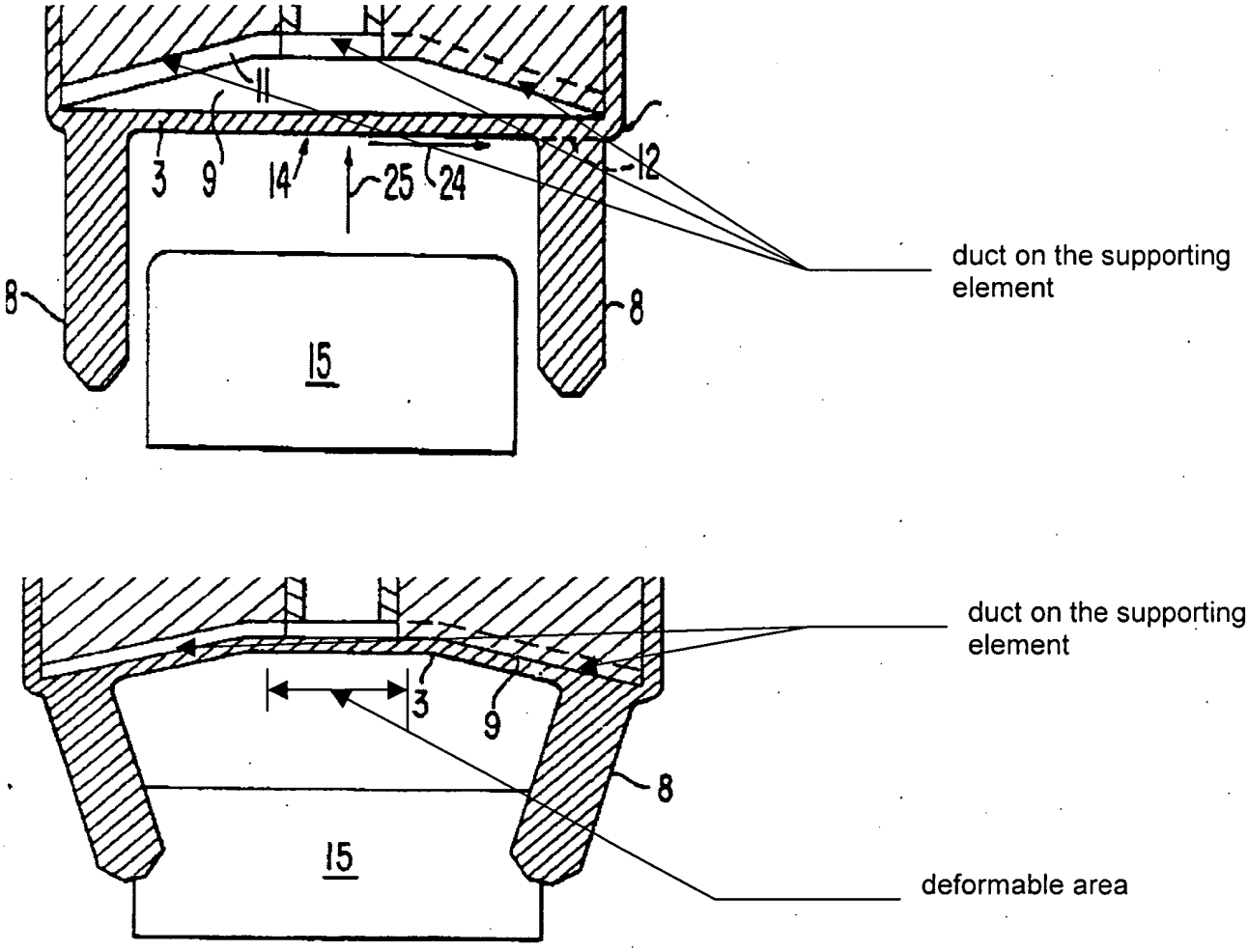
Note that applicant deleted the positively recited phrase "wherein said clutching mechanism is a micro/nano clutching mechanism" and replaced with the functional limitation, "wherein said clutching mechanism is capable of clutching micro and nano sized objects". The intended use of Breu et al. gripper (5,263,753) is for use in the food industry and in the manufacturing of electronic components such as integrated circuits, which are small objects (Col. 1, lines 34-37). Breu et al. gripper (5,263,753) teaches that "the arrangement shown here is specifically part of a manipulator, such as e.g., an industrial robot and is appropriately integrated into the latter, in that the gripper 1 is placed on a movable arm" Col. 2, lines 16-20). The reference is silent about the *dimension of the structural elements* of the gripper. It would have been obvious to optimize *the size of the gripper* (8,8) of Breu et al. gripper to be smaller capable of gripping much smaller objects. Moreover, Conway teaches a robotic arm and grippers to grip very small objects as small as micro objects. Accordingly, those skilled in the nanotechnology would optimize the size of the gripper (8,8) and other elements of Breu et al. gripper to provide capability of gripping small objects.

In response to applicant's argument that Breu reference is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Breu

et al. device clearly disclose that its gripper could be fitted to a robot arm and is capable of gripping small objects such as electronic components (see Col. 1, lines 26-37).

With respect to claim 14, applicant argues that Breu does not meet claim 14. Claim 1 recites, "*at least one elastic layer which is a thin layer with a rim area surrounding a deformable area", "at least two protruding erected on said lower surface of said deformable area"*, and claim 14 further recites, "*said supporting means does not obstruct said deformable area when said deformable area is sunken inwardly*", which is a functional limitation. Figures 1,2,4,5,6,7,9, and 10 of the instant application clearly show a planar sheet or layer supported by a tube, identified as a supporting mechanism wherein some of the middle area of the sheet or layer deformed due to the pressure within the tube caused by a pump. However, applicant *fails to clearly define the deformable area of the elastic sheet or layer*.

It is pointed out that the Breu's device is capable of performing the functional limitation of "the supporting mechanism not obstructing the deformable area when the deformable area is sunken inwardly". Figure 1 of Breu shows a first position of an elastic layer (3) and a supporting mechanism (2) and figure 2 shows *the maximum pulling* of the layer (3) against the supporting mechanism (2) and a deformable area where the supporting mechanism does not obstruct. However, Breu does not show the position between figures 1 and 2 and is capable of performing the functional limitation of "the supporting mechanism not obstructing the deformable area when the deformable area is sunken inwardly". Moreover, Breu's device (see below) also shows that "the support element 2 has radially directed ducts 11, which facilitated movement of the fluid" (Col. 2, lines 7-9, and lines 28-30). Therefore, Breu's device does not obstruct the deformable area.



Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL T. CHIN whose telephone number is (571) 272-6922. The examiner can normally be reached on MON-THURS (7:30 -6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Mackey can be reached on (571) 272-6916. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PTC

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